Arizona Department of Transportation

ROADWAY ENGINEERING GROUP

MEMORANDUM

To: Roadway Design Personnel

ADOT and Consultants

Date: October 31, 2002

From: John L. Louis

Assistant State Engineer

Roadway Engineering Group

Subject: Crash Cushion Selection Procedure

Please implement the attached procedure for selection of crash cushions on projects when crash cushions are being provided.

Project Managers should insure that the procedure is adhered to on their respective projects.

Please distribute this memo within your respective Groups and Districts to all design personnel including consultants, project managers, and appropriate District personnel for their information and use.

C:

Roadway Engineering Group
Traffic Engineering Group
Statewide Project Management
Valley Freeway Group
Districts (10)
FHWA
Regional Traffic Engineers (4)
Bridge Group
Construction Group
Local Government Section
Central Maintenance Group
Contracts and Specifications Section
Local Government Section
District Permits (9)
Engineering Consultant Services
Frank Darmiento
William J. Higgins

CRASH CUSHION SELECTION PROCEDURE
ROADWAY ENGINEERING GROUP
October 31, 2002

The following guidance is provided for design and selection of crash cushion devices for permanent use. This guidance does not apply to guard rail end terminals or to temporary crash cushion devices during construction.

Devices for Crash Cushion design can be found on the Approved Products List (APL). Subcategory V-1 lists the crash cushions that have been approved through the PRIDE process. The APL can be viewed at the ADOT website: http://www.dot.state.az.us/about/atrc/pride/apl.htm

Selection of possible crash cushions requires that they be NCHRP 350 approved devices. The normal usage for high speed applications requires a TL3 design. Designs for lower speeds (45mph and less) are normally available from the manufacturer and can be considered for urban and low speed applications.

The designer is to select devices from the APL for use that will meet the design requirements of the specific application. The manufacturers and their representatives can be contacted for design manuals, consultation on installation details and other specific requirements. Site preparation details as needed should be included with the specific applications selected.

There are a substantial number of devices that can be considered from the list and it is also evident that one device will not always substitute for another. It is desirable that more than one device be considered for a specific location in order to promote competition in bidding. It is also recognized that with consideration of cost, construction and maintenance requirements, one device may be preferred for a specific location.

ADOT has adopted a criteria for usage of crash cushion devices for APL Category V-1 that requires the concurrence of the District Engineer to maintain a crash cushion device that is constructed on a project. This is to ensure that the District is comfortable and willing to maintain a device and that an undue burden for maintenance of proprietary crash cushions is not imposed on a District. This procedure recognizes that ease of maintenance of a device is an important factor in addition to performance of the device. It is in the public interest not to impose devices on the Districts which are not within their resources to maintain.

The following procedure outlines the steps to finalizing the crash cushions to be shown on the plans:

1. Review the devices on the APL which will fully satisfy the requirements of the design.

2. Determine if other factors such as site restrictions or cost will further narrow the design alternatives.

3. Discuss the alternatives with the District Engineer representative (normally the District Maintenance Engineer) to achieve concurrence on all devices selected.

4. Provide Alternates where practicable.

5. The Engineer preparing the roadway design plans will prepare documentation of the decisions in the design file for future reference.

6. In the event it is determined that only one alternative is recommended, the design engineer will prepare a request for approval to the Project Manager providing justification for use in the public interest.

   a) On projects having ADOT approval authority, the Project Manager, acting on behalf of the Assistant State Engineer, will review and approve the request if acceptable and in accordance with these guidelines. The Project Manager may wish to confer with the respective Assistant State Engineer prior to approval.

   b) On Federal-aid projects where the FHWA has direct approval authority, the Project Manager will submit the requests to the FHWA for approval.

   Documentation preparation and requests for approvals must be made early in the design process to avoid delay of bid.

7. Copies of all approvals will be sent to Contracts and Specifications and the Design Engineer and will be placed in the project file.

APL Category V-3 provides alternative manufacturer designs for Sand Barrel Crash Cushions. All of the manufacturer designs shown are equal alternatives and are interchangeable. Any of the alternatives can be provided by a contractor. Standard Specification 702 covers Sand Barrel Crash Cushions. When it is determined that Sand Barrels are the preferred crash cushion, Step 2 of the above procedure is where they are normally selected due to cost considerations. If sand barrels are the sole selection, a letter to the Project Manager in the public interest is not required due to multiple suppliers of the device on the APL. Please contact Roadway Design for any information or assistance required in respect to this procedure.